Patentansprüche

1. Device to receive tools for the calibration of workpieces, in particular workpieces manufactured by a powder metallurgical process, comprising

a base plate (11) for mounting on the table (13) of a press,

a lower coupling plate (15) for attachment at the lower ram of the press,

an upper coupling plate (19) for attachment at the upper ram (21) of the press,

a die supporting plate (23) located between the base plate (11) and the upper coupling plate (19),

a lower tool receiving unit (25) connected to the lower coupling plate (15) and movable as a whole with the corresponding tool supports, and

an upper tool receiving unit (29) connected to the upper coupling plate (19) and movable as a whole with the corresponding tool supports,

at least one of the tool receiving units (25,29) comprising several tool supports (31,32,33; 31',32',33') and an actuating device (37,38,39; 37',38',39') provided for each tool support for individually moving the tool support back and forth.

2. Device as claimed in claim 1, characterised in that the lower tool receiving unit (25) comprises several tool supports (31,32,33).

3. Device as claimed in claim 1 or 2, characterised in that the upper tool receiving unit (29) comprises several tool supports (31',32',33').

4. Device as claimed in one of the claims 1 to 3, characterised in that the actuating device (37,38,39; 37',38',39') is integrated into the tool receiving unit (25,29).

5. Device as claimed in one of the claims 1 to 4, characterised in that the tool supports (31',32',33') are connected to coupling rods (73,74,75) actuatable by actuating devices (37',38',39') of the press.

6. Device as claimed in one of the claims 1 to 5, characterised in that a central tool support (41) is provided which is actuatable by an actuating device of the press.

7. Device as claimed in one of the claims 1 to 6, characterised in that the respective actuating device (37,38,39; 37',38',39') is hydraulically actuatable.

8. Device as claimed in one of the claims 1 to 6, characterised in that the supporting plate (23) is supported by rods (55) which are axially movable in the base plate (11), and in that the upper position of each rod is limited by a stop (57).

9. Device as claimed in claim 8, characterised in that the rods (55) are movable by hydraulic cylinders (58) of the press.

10. Device as claimed in one of the claims 1 to 9, characterised in that between the base plate (11) and the die supporting plate (23) hydraulic cylinders (58) are located (Fig. 4).

11. Device as claimed in one of the claims 1 to 10, characterised in that a support member (59) for the die supporting plate (23) encircles the lower tool receiving unit (25) close to the center.

12. Device as claimed in claim 11, characterised in that at the support member (59) an adjustable stop (61), e.g. in the form of a threaded ring , for the die supporting plate (23) is located.

13. Device as claimed in one of the claims 1 to 12, characterised in that for each tool support (31,32,33; 31'32',33') an adjustable stop (45,46,47; 45',46',47) for the press position is provided.

14. Device as claimed in one of the claims 1 to 13, characterised in that for each tool support (31,32,33; 31',32',33') an adjustable stop (49,50,51; 49',50',51') for the ejecting position is provided.

15. Device as claimed in one of the claims 1 to 13, characterised in that for the positioning of each tool support (31,32,33; 31',32',33') into ejecting position a measuring system (69) is provided.

16. Press for calibrating workpieces (83), in particular workpieces manufactured by a powder metallurgical process, with a device according to one of the claims 1 to 15.

17. Press according to claim 16, characterised in that the die supporting plate (23) is supported by rods (55) which are axially movable in the base plate (11), the upper position of each rod being limited by a stop (57), and each rod (55) being movable by a hydraulic cylinder (58).

18. Press according to claim 16 or 17, characterised in that a central tool support (41) is provided, and in that said central tool support (41) is movable, preferably hydraulically, by an actuating device located in the lower ram (17) of the press.